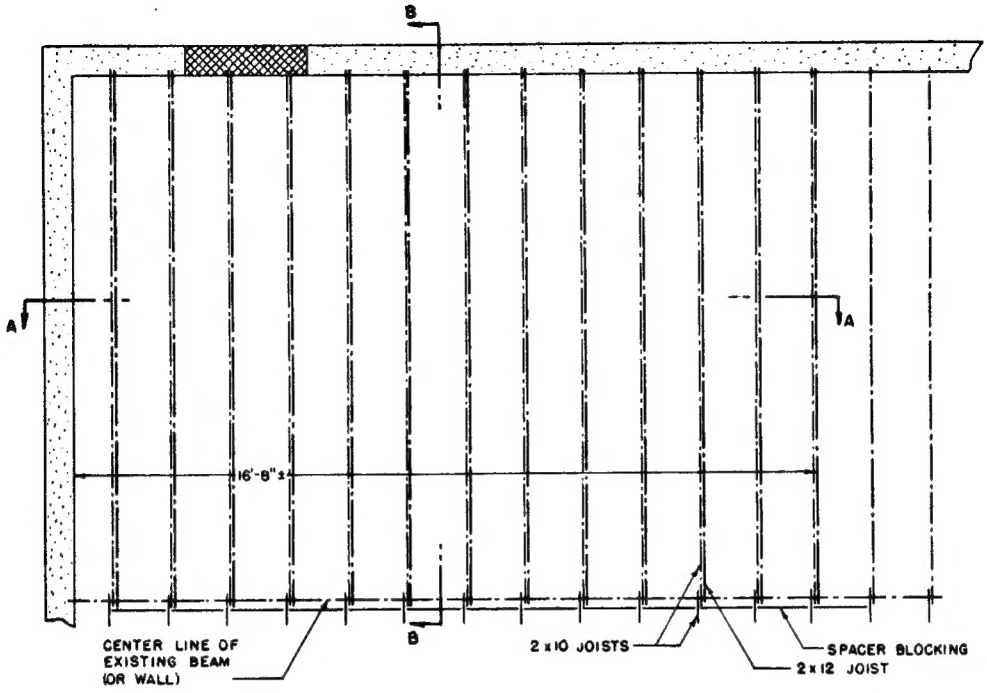
B

H-12-B
May 1980

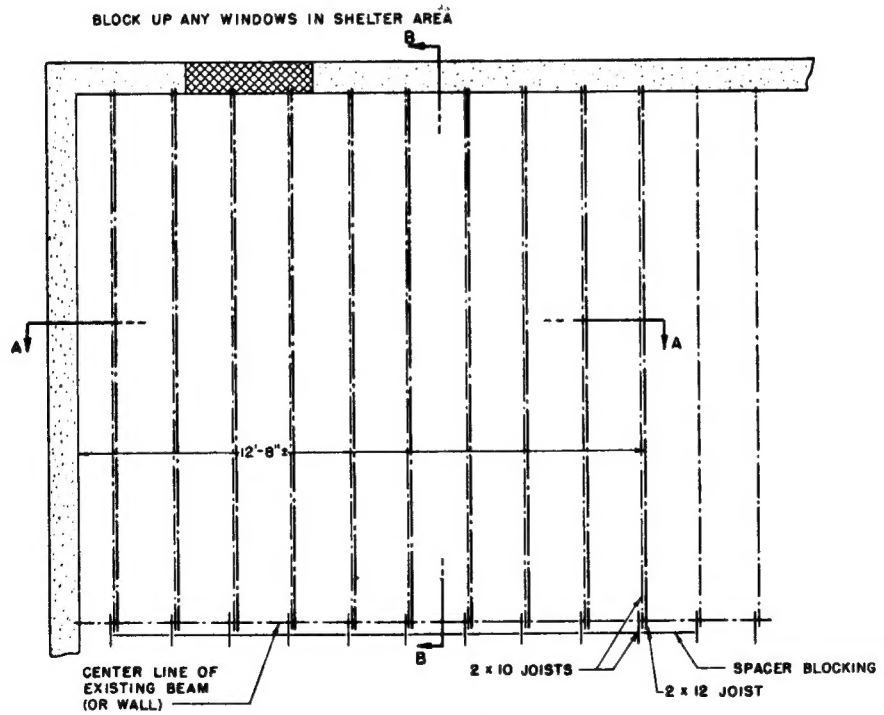
Protection is provided
in a basement corner
by bricks
or concrete blocks
between the overhead joists.
Additional 2″ x 12″ joists
support
the extra weight.

HOME FALLOUT SHELTER
modified ceiling shelter–basement location plan b

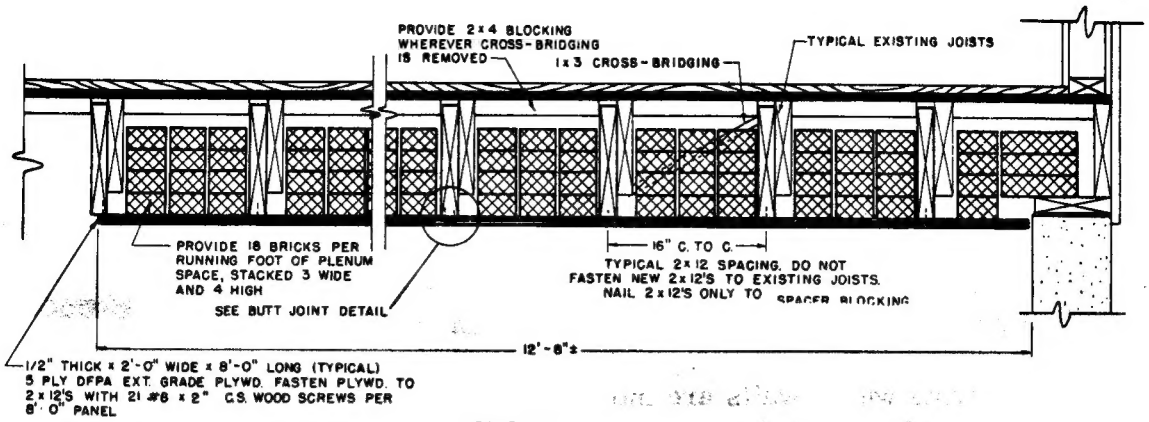
FEDERAL EMERGENCY
MANAGEMENT AGENCY



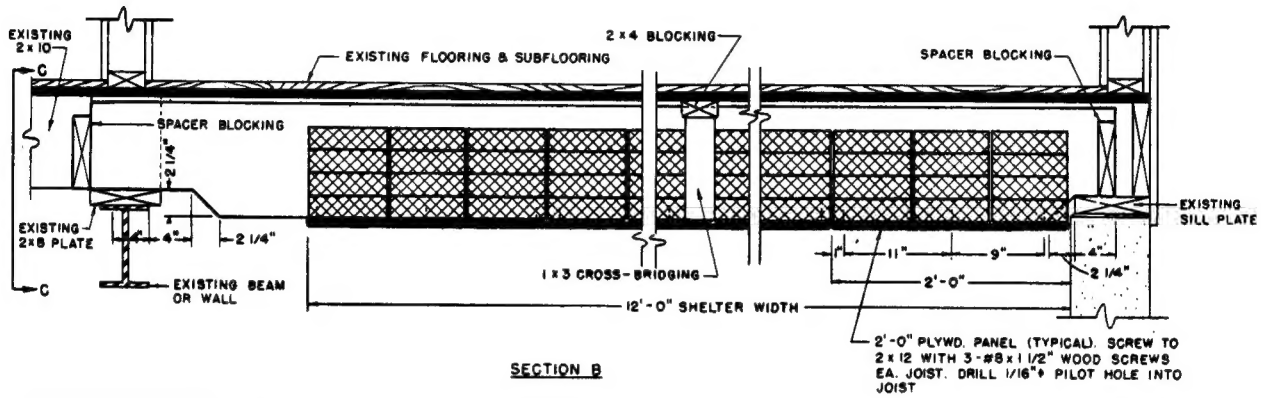
PLAN FOR 12' x 16' SHELTER



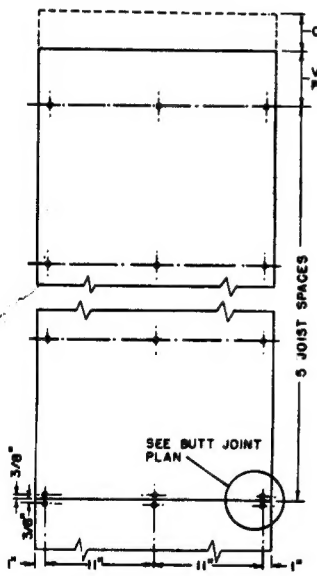
PLAN FOR 12' x 12' SHELTER


PROVIDE 2 x 4 BLOCKING WHEREVER CROSS-BRIDGING IS REMOVED
1 x 3 CROSS-BRIDGING
TYPICAL EXISTING JOISTS
PROVIDE 18 BRICKS PER RUNNING FOOT OF PLENUM SPACE, STACKED 3 WIDE AND 4 HIGH
SEE BUTT JOINT DETAIL
16" C. TO C.
TYPICAL 2 x 12 SPACING. DO NOT FASTEN NEW 2 x 12'S TO EXISTING JOISTS. NAIL 2 x 12'S ONLY TO SPACER BLOCKING
12'-8"±
1/2" THICK x 2'-0" WIDE x 8'-0" LONG (TYPICAL) 5 PLY DFPA EXT. GRADE PLYWD. FASTEN PLYWD. TO 2 x 12'S WITH 21 #8 x 2" C.S. WOOD SCREWS PER 8'-0" PANEL

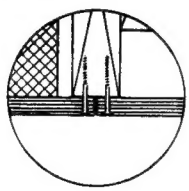
SECTION A



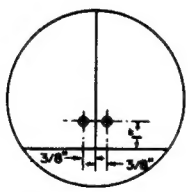
SECTION B



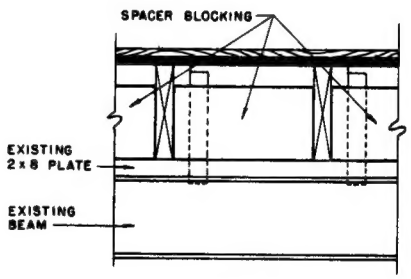
PLAN OF TYPICAL PLYWOOD CEILING PANEL



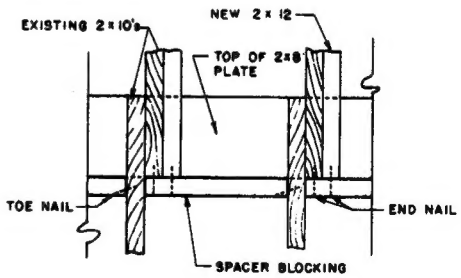
BUTT JOINT DETAIL



BUTT JOINT PLAN



SECTION C



PLAN DETAIL OF SPACER BLOCKING

GENERAL INFORMATION

This shelter can be permanently installed in the basement of your home and will not interfere with its utility in any way.

In basements whose walls are mostly below grade on all four sides, adequate shelter from fallout radiation is provided by modifying the overhead 2 x 10 floor joist and ceiling construction as shown in the drawings. New 2 x 12 joists, notched to the depth of the existing 2 x 10s, are installed alongside these joists in order to carry the extra weight of the shielding material. Plywood, screwed to the 2 x 12 bottoms, supports the masonry and provides a solid base for a more decorative ceiling treatment.

Approximately 2 man days are required to construct the ceiling.

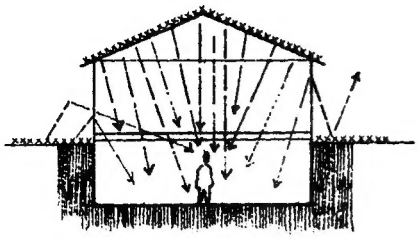
SHELTER SIZE

The plans on the preceding pages show two sizes of shelters of this type - a 12' x 16' size, which may be suitable for use in many one story homes, and a 12' x 12' size, which is suitable for use in many two story homes.

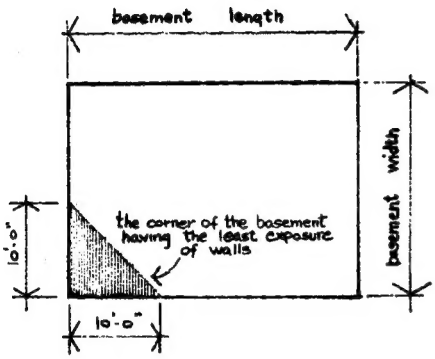
On the following pages, under LIMITATIONS OF THE CEILING MODIFICATION SHELTER IN BASEMENTS, you will find illustrations of the conditions which make this type of construction an effective shelter, and some additional things that must be done if these conditions are not met by your particular basement situation.

Note that if some joist spaces contain heating ducts, or are closed in with sheet metal to serve as return air ducts, the protection in this area of the shelter is reduced since bricks or blocks cannot be placed as shown in the drawings.

LIMITATIONS OF THE CEILING MODIFICATION SHELTER IN BASEMENTS

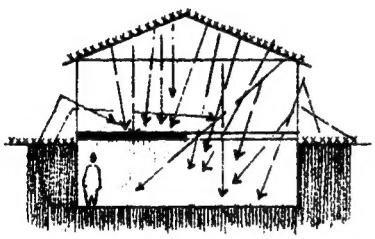


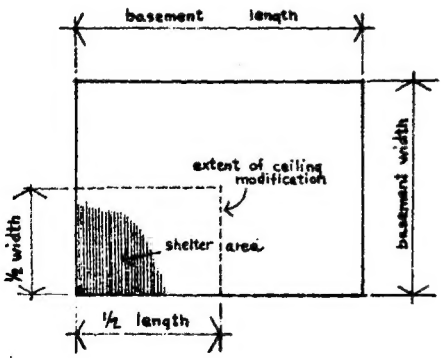
This cross-section of a one story house shows radiation coming into the basement from fallout particles on the roof and the ground. Most of the radiation comes from the roof because of the shielding effect of the ground outside the basement walls.



The shaded area in the basement floor plan shows the location of the best potential shelter area (approximately 50 square feet). The drawings on the preceding pages are for the adding of bricks or blocks in the ceiling over this best corner.

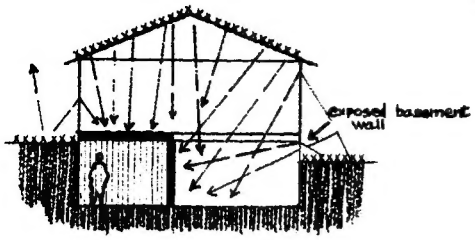
This placement of added weight in the proper portion of the basement ceiling will considerably improve the protection in the best corner. Note that is not necessary to add this weight to the entire ceiling area.

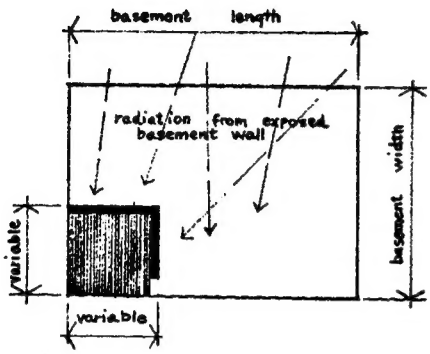




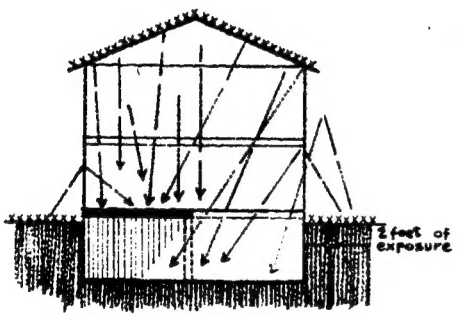
The extent of the ceiling modification area depends on the type of house (i.e., one or two story), the dimensions of the basement, and the amount of basement wall exposure. In a one story house, approximately one - quarter of the area of the basement ceiling should be filled with the concrete blocks or bricks in order to obtain the most protection out of this improvement.

This arrangement will effectively shield all of the radiation coming from the roof - the largest contributing source.





If it is found to be impractical to shield one quarter of the basement ceiling area, the extent of ceiling modification may be reduced to any desired size by constructing vertical masonry walls on the two open sides of the shielded area, thus providing a room suitable for use as a hobby or laundry room. These masonry walls will also provide protection from excessive amounts of radiation coming through exposed portions of the basement wall.



In homes with 2 or more stories above ground, the extent of the basement ceiling modification can usually be reduced to 12' x 12'. Note, however, that vertical side walls may be required if the basement wall exposure exceeds two feet.

Adding bricks or blocks to the basement ceiling can also create shelter in certain portions of the basements of split-level houses. It is recommended that expert advice be sought for basement situations which do not fit the plan sizes or illustrations in this pamphlet.

The MATERIALS LIST shows quantities for the two plan sizes shown. If additional materials are required for the building of shielding walls in an emergency, they must be added to the list.

MATERIALS LIST

Item	Actual Number Required For 12' x 16' Size	Actual Number Required For 12' x 12' Size
Masonry:		
2-1/4" x 4" x 8" solid bricks	2592	1944
Lumber ("Construction" or "No. 1" grades or better):		
New joists 2 x 12 cut to fit existing span	14	11
Blocking 2 x 8 x 1'-0-3/4"*	24	18
2 x 4 x 1'-0-3/4"*	12	9
Plywood sheets		
1/2" 5-ply, Utility B-C grade, good one side		
2'-0" x 8'-0" sections	12	6
2'-0" x 4'-0" sections		6
Hardware:		
#8 x 2" cad. plated wood screws	288	216
16d common nails	3 lbs.	3 lbs.

*Cut to fit exact joist spacing

CONSTRUCTION SEQUENCE

1. Cut 2 x 12s to length required for bearing at both ends (see drawing).
2. Cut end notches in 2 x 12s as shown on drawings. Be sure to ease the notch at 45° or less angle as shown. Be careful not to saw further than 2" notch depth required.
3. Starting at the wall, remove the cross bridging from 6 joist spaces and insert the 2 x 12s into the spaces over the center beam or wall, shaving the joist as far as is needed to allow raising the end at the outside wall for seating on the plate.
4. Measure the width of the spaces left and cut the center and end blocking.
5. Install the center and end blocking, nailing as shown in the details.
6. Reinstall one (shortened) piece of cross-bridging under the center blocking.
7. Starting at the wall, attach one 1/2" plywood panel to the 2 x 12s, using the two inch #8 screws as shown in the plan.
8. Fill the joist spaces above the plywood with bricks or a combination of blocks and bricks to provide as much weight as possible in the depth of the 2 x 12s, which is the intention of the drawings.
9. Repeat steps 7 and 8 for the entire width of the shelter.
10. Repeat steps 3 through 9 for the balance of the length of the shelter.

Before constructing the shelter described here, you should check to see that the construction conforms to your local building codes, and whether a building permit is required.

If work is to be done by a builder or contractor, it is recommended that firms be retained that carry necessary insurance and guarantees to properly protect the owner against subsequent liability and claims on the work and to ensure satisfactory results. Members of the National Association of Home Builders and the Associated General Contractors meet these and other requirements of protection for the home owner.

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